Bellwork: 1/11/13

conjugate

1) $\frac{3-4i}{2+i} \cdot \frac{(2-i)}{(2-i)} = \frac{2-11i}{5}$

Top:

$(3-4i)(2-i)$

$6-3i-8i+4i^2$

$4(-1)$

$6-3i-8i-4$

$2-11i$

Bottom:

$(2+i)(2-i)$

$4-2i+2i-i^2$

$4--1$

5

Page 1

$\frac{3-2i}{0+5i} \cdot \frac{-5i}{-5i} = \frac{-10-15i}{25} = \frac{-2-3i}{5}$

Top:

$-5i(3-2i)$

$-15i+10i^2$

$-15i+10(-1)$

$-15i-10$

Bottom:

$5i \cdot -5i$

$-25i^2$

$-25(-1)$

25

Page 2

(28) $\frac{-2i}{1+i} \cdot \frac{1-i}{1-i} = \frac{-2-2i}{2} = \frac{-1-1i}{1} = -1-i$

Top:

$-2i(1-i)$

$-2i+2i^2$

$-2i+2(-1)$

$-2i-2$

Bottom:

$(1+i)(1-i)$

$1-i+i-i^2$

$1--1$

2

(30) $\frac{i+2}{i-2} \cdot \frac{(i+2)}{(i+2)} = \frac{3+4i}{-5}$ or $\frac{-3-4i}{5}$

Top:

$(i+2)(i+2)$

$i^2+2i+2i+4$

$-1+4i+4$

$3+4i$

Bottom:

$(i-2)(i+2)$

$i^2+2i-2i-4$

$-1-4$

-5

Section 4.8 - Complex Numbers and the Quadratic Formula

Solve the following quadratic equations:

1) $2x^2 - 3x + 5 = 0$

$a=2 \quad b=-3 \quad c=5$

$$\frac{3 \pm \sqrt{(-3)^2 - 4(2)(5)}}{2(2)}$$

$$\frac{3 \pm \sqrt{-31}}{4} = \frac{3 \pm i\sqrt{31}}{4}$$

2) $-x^2 + 4x - 5 = 0$

$a=-1 \quad b=4 \quad c=-5$

$$\frac{-4 \pm \sqrt{(4)^2 - 4(-1)(-5)}}{2(-1)}$$

$$\frac{-4 \pm \sqrt{-4}}{-2} = \frac{-4 \pm i\sqrt{4}}{-2} = \frac{-4 \pm 2i}{-2}$$

$$\frac{-2 \pm i}{-1} = 2 \pm 1i$$

3) $3x^2 = x - 2$

$-x + 2$

$3x^2 - x + 2 = 0$

$a = 3 \quad b = -1 \quad c = 2$

$$\frac{1 \pm \sqrt{(-1)^2 - 4(3)(2)}}{2(3)}$$

$$\frac{1 \pm \sqrt{-23}}{6} = \frac{1 \pm i\sqrt{23}}{6}$$

4) $4x^2 + 12 = -12x$

$+ 12x$

$4x^2 + 12x + 12 = 0$

$\frac{4(x^2 + 3x + 3)}{4} = \frac{0}{4}$

$x^2 + 3x + 3 = 0$

$a = 1 \quad b = 3 \quad c = 3$

$$\frac{-3 \pm \sqrt{(3)^2 - 4(1)(3)}}{2(1)}$$

$$\frac{-3 \pm \sqrt{-3}}{2} = \frac{-3 \pm i\sqrt{3}}{2}$$

Homework: pg 253 # 39-44

(39) $x^2 + 2x + 3 = 0$

(40) $-3x^2 + x - 3 = 0$

(41) $2x^2 - 4x + 7 = 0$

(42) $x^2 - 2x + 2 = 0$

(43) $x^2 + 5 = 4x$

(44) $2x(x-3) = -5$